WORK IT OUT

A maths workbook — concepts, worked examples, graded practice and number puzzles

Do the Learn First pages before the practice. Do the practice before the puzzles. Full solutions are at the back — but they only help you after you have tried.

Part	What it is	How to use it	Time
1	Learn First	Read and annotate. Copy every worked example by hand.	25 min
2	Worked Examples	Cover the solution. Try. Then compare line by line.	20 min
3	Guided Practice	Steps are given; you fill the gaps.	15 min
4	Practice Set A · Fluency	Straight application. Aim for speed and accuracy.	20 min
5	Practice Set B · Reasoning	Multi-step. Show every line.	25 min
6	Practice Set C · Challenge	Stretch problems. One may beat you — that is fine.	25 min
7	The Crossnumber	Answers are numbers. Wrong maths will not fit.	20 min
8	Number Search & Magic Square	Solo or pairs.	15 min
9	Spot the Mistake	Audit a worked solution. Find the planted error.	15 min
10	Quick-Fire Round	Matching, True/False, Two Truths and a Lie.	15 min
11	The Escape Challenge	Teams of 4.	25 min

Part 1 · Learn First

An algebraic expression is a sentence written with letters instead of some of the words. A linear polynomial is the simplest, most useful sentence of that kind — and it is everywhere: bills, fares, ages, wires bent into rectangles.

Algebraic expressions, terms, variables and coefficients

An algebraic expression is built from numbers and letter-numbers (**variables**) joined by $+, -, \times, \div$.

Where it comes from. Raju buys x red boxes (4 pens each) and y blue boxes (5 pencils each), plus 3 free pens. The total is the algebraic expression $4x+5y+3$.

A rectangular garden of length l m and width w m, fenced at ₹100/m along the length, ₹80/m along the width, with seeding at ₹50 per square metre, costs $(200l+160w+50lw)$ rupees in total.

Word	Meaning	Example (in $4x+5y+3$)
Term	a part of the expression separated by $+$¿ or $-$¿	$4x$, $5y$, 3
Variable (letter-number)	a symbol standing for an unknown number	x, y
Coefficient	the number multiplying a variable	4 is the coefficient of x
Constant	a term with no variable attached	3

> **Rule to remember**
>
> - A **term** is separated from the next by a $+$¿ or $-$¿ sign.
> - The **coefficient** is the number multiplying the variable; the **constant** term has no variable at all.
> - An expression may have **one variable** (e.g. $3z+7$) or **more than one** (e.g. $4x+5y+3$). This chapter deals only with one-variable expressions.

Polynomials in one variable, and their degree

Algebraic expressions in a single variable and its powers are called **one-variable (univariate) polynomials**. The highest power of the variable is called the **degree**.

A wire of length 20 cm is bent into a rectangle of length x cm and width $(10-x)$ cm. The area is $x(10-x)=10x-x^2$ — a polynomial of degree 2, since it involves x^2.

In $5y^3+y^2+2y-1$: the coefficient of y^3 is 5, of y^2 is 1, of y is 2, and the constant term is -1.

Polynomial	Degree	Name
8 (i.e. $8x^0$)	0	constant polynomial
$3z+7$	1	**linear** polynomial
x^2+5x+1	2	quadratic polynomial
$5y^3+y^2+2y-1$	3	cubic polynomial

> **Rule to remember**
>
> - **Degree = highest power of the variable** that appears with a non-zero coefficient.
> - Degree 0 → constant polynomial; degree 1 → **linear** polynomial; degree 2 → quadratic; degree 3 → cubic.

Linear polynomials in one variable: form and evaluation

A linear polynomial in x has the general form $ax+b$, with $a \neq 0$.

Example. The perimeter of a square of side x is $4x$ — a linear polynomial (here $a=4$, $b=0$).

Example. A chess club charges a joining fee of ₹200 plus ₹50 per match. If m is the number of matches, the amount paid is $200+50m$ — a linear polynomial in m.

Evaluating a polynomial means substituting a value for the variable. For the linear polynomial $2x+3$: at $x=4$, the value is $2(4)+3=11$; at $x=-6$, the value is $2(-6)+3=-9$. Think of the polynomial as an **input-output machine** — you feed in x, it hands back the value.

Note $2x+3$ is a **linear** function, whereas $10x-x^2$ is a **quadratic** function — evaluation works the same way for both, only the degree differs.

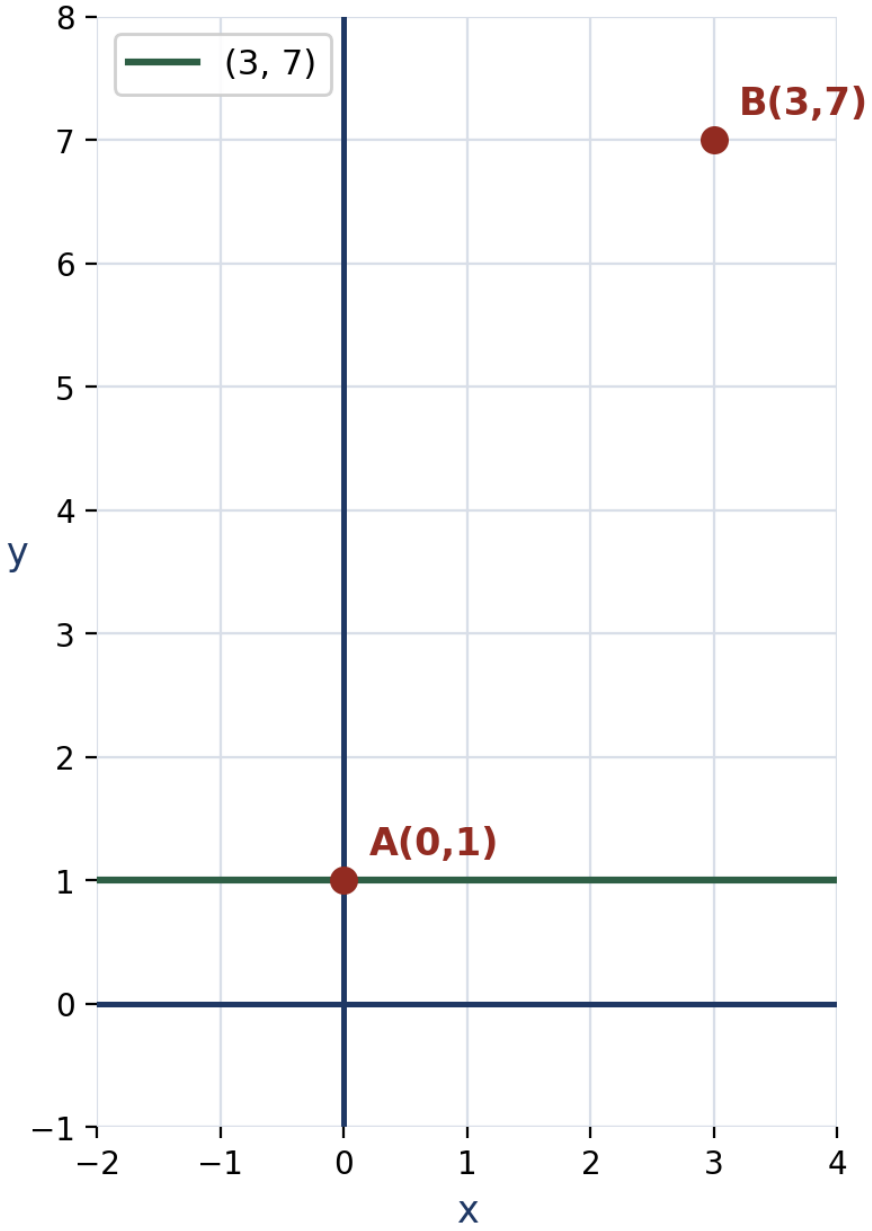


Fig. 2.1 — the linear relationship y = 2x + 1 plotted through two points

Rule to remember

- General linear polynomial: $ax+b$, where a and b are constants and $a \neq 0$.
- To **evaluate** a polynomial at $x=k$, replace every x by k and simplify.

The zero of a linear polynomial

The **zero** of a polynomial $p(x)$ is the value of x for which $p(x)=0$. For the linear polynomial $ax+b$, setting it to 0 gives a **linear equation**.

Solving $ax+b=0$: $ax=-b$, so $x=\frac{-b}{a}$. This single value is the zero of the linear polynomial — the point where the input-output machine outputs exactly 0.

Example. Find the zero of $2x-3$. Set $2x-3=0 \Rightarrow 2x=3 \Rightarrow x=\frac{3}{2}=1.5$. Check: $2(1.5)-3=0$. ✓

Connection to equations. When we equate a linear polynomial in one variable to a constant, we get a **linear equation**. E.g. the sum of two numbers is 64, one is 10 more than the other: letting the smaller be x, $x+(x+10)=64$ gives the linear equation $2x+10=64$, i.e. $2x=54$, $x=27$; the numbers are 27 and 37.

Fig. 2.2 — the zero of the linear polynomial 2x − 3 marked on the number line

Rule to remember

- **Zero of $ax+b$:** $x=\frac{-b}{a}$ (exists and is unique whenever $a \neq 0$).
- A linear polynomial has **exactly one** zero — unlike quadratics, which can have none, one, or two.

Finding a zero, step by step

Find the zero of the linear polynomial $5x-15$.

Set the polynomial equal to 0: $5x-15=0$.

Add 15 to both sides: $5x=15$.

Divide both sides by 5: $x=3$.

Check: $5(3)-15=15-15=0$. ✓ The zero is $x=3$.

Linear growth, linear decay and linear relationships

$y = ax + b$

A **linear pattern** is a sequence where the difference between consecutive terms is constant. When one quantity increases by a fixed amount, it is **linear growth**; when it decreases by a fixed amount, it is **linear decay**.

Finding a and b from data. A telecom bill follows $y = ax + b$. Using 10 GB costs ₹350; using 20 GB costs ₹550. Substituting: $350 = 10a + b$ and $550 = 20a + b$. Subtracting the first from the second: $200 = 10a$, so $a = 20$; then $b = 350 - 10(20) = 150$. So $y = 20x + 150$ — ₹150 is the fixed fee, ₹20 the per-GB charge.

Situation	Linear expression	Type
Square-tile pattern, stage n	$2n - 1$	growth
Journey cost for distance d km	$C(d) = 100 + 60d$	growth
Tank water height after t months	$h(t) = 3 - 0.5t$	decay
Pocket money left after n days (spend ₹5/day from ₹100)	$100 - 5n$	decay

Rule to remember

- **Linear growth:** quantity increases by a constant amount over equal intervals.
- **Linear decay:** quantity decreases by a constant amount over equal intervals.
- To find a, b in $y = ax + b$ from two data points, form two equations and eliminate one variable by substitution or subtraction.

Part 2 · Worked Examples

Cover the right-hand column with a sheet of paper. Try the problem yourself first. Then uncover it one line at a time and check where your reasoning parted from the model.

Example 1 — Find the degree and evaluate a linear polynomial

Consider the polynomial $5x-3$. State its degree, then find its value at $x=0,-1,2$.

Degree. The highest power of x is 1, so $5x-3$ is a linear polynomial (degree 1).

At $x=0$: $5(0)-3=-3$.

At $x=-1$: $5(-1)-3=-5-3=-8$.

At $x=2$: $5(2)-3=10-3=7$.

Answer: degree 1; values $-3,-8,7$.

> **Why this works**
>
> Evaluating just means substituting and simplifying — the degree tells you nothing about the numeric answer, only about the shape of the expression.

Example 2 — Find the zero of a linear polynomial

Find the zero of the linear polynomial $4z-3$ from Exercise Set 2.1.

Set the polynomial to 0: $4z-3=0$.

Add 3 to both sides: $4z=3$.

Divide by 4: $z=\frac{3}{4}$.

Check: $4(\frac{3}{4})-3=3-3=0$. ✓

Answer: the zero is $z=\frac{3}{4}$.

> **Why this works**
>
> A linear polynomial $az+b$ always has exactly one zero, $z=\frac{-b}{a}$, because dividing by $a\neq 0$ is always possible.

Example 3 — Salil and his mother — form and solve a linear equation

The present age of Salil's mother is three times Salil's present age. After 5 years, their ages will add up to 70. Find their present ages.

Let Salil's present age be x. His mother's present age is $3x$.

After 5 years: Salil is $x+5$, mother is $3x+5$.

Their ages add to 70: $(x+5)+(3x+5)=70$.

Simplify: $4x+10=70 \Rightarrow 4x=60 \Rightarrow x=15$.

Answer: Salil is 15 years old; his mother is $3(15)=45$ years old.

> **Why this works**
>
> Writing "3 times" and "5 years later" as $3x$ and $x+5$ is the whole skill — once the sentence becomes an equation, solving it is routine.

Example 4 — Finding a and b in a linear relationship y = ax + b

A gym bill is $y=ax+b$, where x is hours of badminton court used. 10 hours costs ₹800; 15 hours costs ₹1100. Find a and b.

Substitute both data points: $800=10a+b$ and $1100=15a+b$.

Subtract the first equation from the second: $300=5a$, so $a=60$.

Substitute back: $800=10(60)+b \Rightarrow 800=600+b \Rightarrow b=200$.

Answer: $a=60$, $b=200$, so $y=60x+200$ — a fixed fee of ₹200 plus ₹60 per hour.

> **Why this works**
>
> Subtracting the two equations eliminates b instantly because its coefficient is the same (1) in both — always look for that shortcut before substituting.

Part 3 · Guided Practice

The method is laid out for you. Fill in the blanks. If you can do these without looking back at Part 2, you are ready for Part 4.

1. Find the degree of y^3+2y-1 and state whether it is linear, quadratic or cubic.

The highest power of y present is _____ .

So the degree of the polynomial is _____ .

A polynomial of this degree is called a _____ polynomial.

---

2. Find the value of the linear polynomial $5x-3$ at $x=-1$.

Substitute $x=$¿ _____ into $5x-3$.

5¿

Final value: _____

---

3. Find the zero of the linear polynomial $3z+7$.

Set the polynomial equal to _____ .

$3z+7=0 \Rightarrow 3z=$¿¿

Divide both sides by 3: $z=$¿ _____ .

---

4. A telecom balance starts at ₹600 and drops by ₹15 per day used. Write $b(x)$ and find when it runs out.

Balance after x days: $b(x)=600-$¿ x.

Balance runs out when $b(x)=0$: $600-15x=0 \Rightarrow 15x=$¿¿.

Divide by 15: $x=$¿ _____ days.

---

5. Find a and b if $y=ax+b$, given $x=0, y=32$ and $x=100, y=212$ (this is the °F–°C style relation, reversed).

Substitute the first point: $32=a$¿.

Substitute the second point: $212=100a+$¿¿.

Solve: $100a=$¿ $a=$¿ _____ .

Practice Set A · Fluency

Straight application of the method. Aim to get every one right, then aim to get them right quickly.

#	Question	Your working and answer
1	Find the degree of the polynomial $2x^2-5x+3$.	
2	Find the degree of the polynomial -9.	
3	Write one example each of a polynomial of degree 1, degree 2 and degree 3.	
4	What are the coefficients of x^2 and x^3 in $x^4-3x^3+6x^2-2x+7$?	
5	What is the coefficient of z in $4z^3+5z^2-11$?	
6	What is the constant term of $9x^3+5x^2-8x-10$?	
7	Find the value of the linear polynomial $5x-3$ at $x=0$.	
8	Find the value of the linear polynomial $5x-3$ at $x=2$.	
9	Find the zero of the linear polynomial $2x-3$.	
10	Find the zero of the linear polynomial $4z-3$.	

Practice Set B · Reasoning

Two or more steps, or a step you have to choose for yourself. Show every line — marks live in the working.

#	Question	Your working and answer
1	Find the value of the quadratic polynomial $7s^2-4s+6$ at $s=-3$.	
2	Find the zero of the linear polynomial $6x+18$.	
3	The difference between two positive integers is 63, and their ratio is $2:5$. Find the two integers.	
4	Ruby has 3 times as many two-rupee coins as five-rupee coins, totalling ₹88. How many coins of each type does she have?	
5	A 300-foot fence is cut into two pieces; the longer piece is four times the shorter. How long is each piece?	
6	A rectangle's length is three more than twice its width, and its perimeter is 24 cm. Find its dimensions.	
7	A learning platform bill follows $y=ax+b$: 10 modules cost ₹400, 14 modules cost ₹500. Find a and b.	
8	A chess club charges $200+50m$ rupees for m matches. If a player paid ₹750, how many matches did they play?	

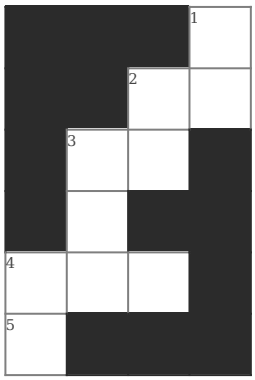
Practice Set C · Challenge

Harder, and deliberately so. If one defeats you, write down exactly where you got stuck. That sentence is worth more than a copied answer.

#	Question	Your working and answer
1	A wire of length 20 cm is bent into a rectangle of length x cm. Write the area as a polynomial in x and state its degree.	
2	For the pattern $2n-1$ (square tiles), find which stage contains 47 tiles.	
3	A phone bought for ₹10,000 loses ₹800 in value every year. Write $v(t)$ and find after how many years the value first drops to ₹0 or below.	
4	Given °C ¿ a°F+ b, with ice melting at $0\,°C = 32\,°F$ and water boiling at $100\,°C = 212\,°F$, find a and b.	
5	Two numbers sum to 64, and one is 10 more than the other. Form the linear equation, find both numbers, and identify the linear polynomial used before it was equated to 64.	

Part 7 · The Crossnumber

Every answer is a number. One digit per square. Because answers cross, a wrong calculation simply will not fit — this puzzle marks itself.



ACROSS

2. Amount left of ₹100 after spending ₹5/day for 12 days *(2 digits)*

3. The zero (×10) of $2x-30$ *(2 digits)*

4. b in the gym-bill relation y = 60x + 200 *(3 digits)*

5. The zero of $3z-21$ *(1 digits)*

DOWN

1. a in the gym-bill relation y = 60x + 200 *(2 digits)*

2. Salil's mother's age if Salil is 15 and mother is 3 times as old *(2 digits)*

3. b in y = 20x + 150 (fixed fee example) *(3 digits)*

4. x in $x+(x+10)=64$ *(2 digits)*

Bonus questions that did not fit the grid — work them out anyway: a in y = 20x + 150 (data-charge example); Value of 2x + 3 at x = 4; Absolute value of 2x + 3 at x = -6; Auto fare for 10 km: 25 + 15×8

Part 8 · Number Search & Magic Square

Work out each answer, then find it hidden in the digit grid — across, down, diagonally or backwards.

4	0	1	6	7	1	6	2	8	5	9	8
2	0	8	2	8	1	6	9	6	9	7	7
9	6	8	0	1	3	4	5	5	6	4	1
4	3	5	5	5	8	0	5	3	9	8	2
0	6	6	0	8	0	3	6	0	6	3	9
1	8	3	2	2	1	4	0	6	4	7	0
1	5	9	7	0	8	7	5	3	5	4	0
4	7	7	0	2	7	3	2	7	8	5	7
5	2	3	6	3	0	9	0	4	5	2	0
2	3	0	4	5	8	0	0	3	9	1	5
8	8	2	0	5	1	1	0	5	1	5	4
1	3	8	8	7	7	5	1	4	7	2	7

☐ 150	☐ 145	☐ 200	☐ 700	☐ 350
☐ 15	☐ 27	☐ 45	☐ 20	☐ 11
☐ 40	☐ 60			

Magic Square — every row, column and diagonal adds to the same total.

8		**6**
3		**7**
		2

Magic constant: 15. Fill the empty cells.

Part 9 · Spot the Mistake

Each solution below reaches a wrong answer, and exactly one step is to blame. Find the first wrong step and rewrite it correctly. Marking other people's work is the fastest way to stop making their mistakes.

□ Spot the Mistake

Finding the zero of $3z+7$

Step 1. Set the polynomial equal to 0: $3z+7=0$.

Step 2. Subtract 7 from both sides: $3z=7$.

Step 3. Divide by 3: $z=\frac{7}{3}$.

_____ The first wrong step is Step _____ . What should it say?

_____

□ Spot the Mistake

Evaluating $7s^2-4s+6$ **at** $s=-3$

Step 1. Substitute: $7¿$.

Step 2. $¿$, so the first term is $7x-9=-63$.

Step 3. $-4(-3)=12$, so the expression is $-63+12+6=-45$.

_____ The first wrong step is Step _____ . What should it say?

_____

□ Spot the Mistake

Identifying the degree of $x^4-3x^3+6x^2-2x+7$

Step 1. The polynomial has 5 terms, so its degree is 5.

Step 2. The degree is the highest power of x present.

Step 3. The highest power present is x^4, so the degree is 4.

_____ The first wrong step is Step _____ . What should it say?

_____

Part 10 · Quick-Fire Round

Match each linear polynomial or situation to its zero / key value

Draw a line from each item on the left to its match on the right.

#	Left	Right (shuffled)
1	$2x-3$	$200+50m$
2	$3z+7$	$a=1.8, b=32$
3	$4z-3$	$4x$
4	$5x-15$	$x=3$
5	$6x+18$	$x=-3$
6	Perimeter of square, side x	$x=1.5$
7	Chess club fee: ₹200 + ₹50/match	$z=-7/3$
8	°C to °F relation constants	$z=3/4$

True or False Sprint

Everyone stands. Teacher reads a statement. True → stay standing. False → sit down.

#	Statement	Your call
1	A linear polynomial has degree exactly 1.	☐ True ☐ False
2	A constant polynomial like 8 has degree 1.	☐ True ☐ False
3	The polynomial x^2+5x+1 is linear.	☐ True ☐ False
4	In $4x+5y+3$, the number 3 is called the constant term.	☐ True ☐ False
5	The general form of a linear polynomial in one variable is $ax+b$ with $a \neq 0$.	☐ True ☐ False
6	A linear polynomial can have two different zeros.	☐ True ☐ False
7	The zero of $ax+b$ is $x=\frac{-b}{a}$.	☐ True ☐ False
8	Evaluating a polynomial means finding its degree.	☐ True ☐ False
9	$10x-x^2$ is a quadratic function, not linear.	☐ True ☐ False
10	When we equate a linear polynomial to a constant, we obtain a linear equation.	☐ True ☐ False

#	Statement	Your call
11	Linear decay means a quantity increases by a constant amount each interval.	☐ True ☐ False
12	In $y = a\,x + b$, the value of b can be found once a is known and one data point is used.	☐ True ☐ False

Two Truths and a Lie

Two statements are true, one is false. Circle the lie — then correct it.

Set 1

(a) $3\,z + 7$ is a linear polynomial.

(b) The zero of $3\,z + 7$ is $z = 7/3$.

(c) The zero of $3\,z + 7$ is $z = -7/3$.

The lie is _____ . Corrected: _____

Set 2

(a) Degree of $5\,y^{3} + y^{2} - 8$ is 3.

(b) Degree of -9 is 0.

(c) Degree of -9 is undefined because it has no variable.

The lie is _____ . Corrected: _____

Set 3

(a) A linear polynomial always has exactly one zero.

(b) A quadratic polynomial can have two zeros.

(c) A linear polynomial can have zero, one, or two zeros depending on the coefficients.

The lie is _____ . Corrected: _____

Part 11 · The Escape Challenge

Five gates, each a calculation. Each gives you one digit. Collect all five to unlock the exit code.

🔒 GATE 1 — The Degree Gate

Find the degree of $x^4-3x^3+6x^2-2x+7$.

Digit: ☐

🔒 GATE 2 — The Zero Gate

Find the zero of the linear polynomial $5x-15$.

Digit: ☐

🔒 GATE 3 — The Evaluation Gate

Evaluate $5x-3$ at $x=2$.

Digit: ☐

🔒 GATE 4 — The Age Gate

Salil is x years old; his mother is $3x$. After 5 years their ages sum to 70. Find Salil's present age x.

Digit: ☐

🔒 GATE 5 — The Relationship Gate

If $y=ax+b$ with $a=20, b=150$, find y when $x=5$.

Digit: ☐

EXIT CODE: ☐ ☐ ☐ ☐ ☐

Formula Sheet

Cut this page out and keep it. Everything in this chapter, on one page.

General linear polynomial (one variable)

$$ax+b, a\neq 0$$

Zero of a linear polynomial

$$ax+b=0 \Rightarrow x=\frac{-b}{a}$$

Evaluating a polynomial at $x=k$

$$p(k)=ak+b$$

Linear relationship between two variables

$$y=ax+b$$

Finding a, b from two points $(x_1, y_1), (x_2, y_2)$

$$y_2-y_1=a(x_2-x_1) \Rightarrow a=\frac{y_2-y_1}{x_2-x_1}$$

Degree

$$\textit{highest power of the variable with non-zero coefficient}$$

Full Solutions

Not just answers — working. Compare your method with this one; if they differ but both reach the right answer, make sure you understand why yours also works.

Part 3 · Guided Practice

1. highest power 3; degree 3; cubic · **2.** -1; -5 - 3; -8 · **3.** 0; -7; -7/3 · **4.** 15; 600; 40 · **5.** b = 32; 212 = 100a + 32; 100a = 180, a = 1.8

Practice Set A

1. Highest power of x is 2, so degree ¿ 2.

2. $-9=-9x^0$, so degree ¿ 0.

3. e.g. degree 1: $3z+7$; degree 2: x^2+5x+1; degree 3: $5y^3+y^2+2y-1$.

4. Coefficient of x^2 is 6; coefficient of x^3 is -3.

5. Coefficient of z in $4z^3+5z^2-11$ is 0 (there is no z^1 term).

6. Constant term of $9x^3+5x^2-8x-10$ is -10.

7. $5(0)-3=-3$.

8. $5(2)-3=10-3=7$.

9. $2x-3=0 \Rightarrow x=\frac{3}{2}=1.5$.

10. $4z-3=0 \Rightarrow z=\frac{3}{4}$.

Practice Set B

1. 7 ¿.

2. $6x+18=0 \Rightarrow 6x=-18 \Rightarrow x=-3$.

3. Ratio $2:5$ means integers $2k, 5k$; difference $3k=63 \Rightarrow k=21$; integers are 42 and 105.

4. Let five-rupee coins ¿ x, two-rupee coins ¿ $3x$. Value: $5x+2(3x)=88 \Rightarrow 11x=88 \Rightarrow x=8$. So 8 five-rupee coins and 24 two-rupee coins (32 coins total).

5. Let shorter piece ¿ x, longer ¿ $4x$. $x+4x=300 \Rightarrow 5x=300 \Rightarrow x=60$. Pieces are 60 ft and 240 ft.

6. Let width ¿ x, length ¿ $2x+3$. Perimeter: $2(x+2x+3)=24 \Rightarrow 2(3x+3)=24 \Rightarrow 3x+3=12 \Rightarrow x=3$. Width ¿ 3 cm, length ¿ 9 cm.

7. $400=10a+b$, $500=14a+b$. Subtract: $100=4a \Rightarrow a=25$; $b=400-250=150$.

8. $200+50m=750 \Rightarrow 50m=550 \Rightarrow m=11$ matches.

Practice Set C

1. For a 20 cm wire bent to a rectangle of length x cm, width $(10-x)$ cm: area ¿ $x(10-x)=10x-x^2$, a degree-2 (quadratic) polynomial.

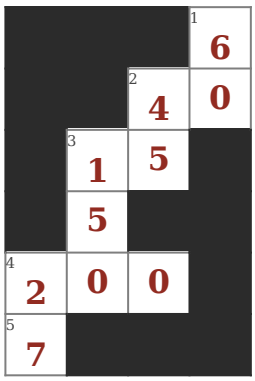
2. $2n-1=47 \Rightarrow 2n=48 \Rightarrow n=24$; Stage 24 has 47 tiles.

3. $v(t)=10000-800t$. $v(t)=0$ when $t=12.5$; so by year 13 the value has reached ₹0 or below (at $t=12$, value is ₹400; at $t=13$, it would go negative, so it effectively bottoms out at 0 during year 13).

4. $32=0\cdot a+b \Rightarrow b=32$. $212=100a+32 \Rightarrow 100a=180 \Rightarrow a=1.8$.

5. Let smaller number be x; larger is $x+10$. $x+(x+10)=64$ is formed from the linear polynomial $2x+10$ equated to 64: $2x+10=64 \Rightarrow 2x=54 \Rightarrow x=27$. Numbers are 27 and 37.

Part 7 · Crossnumber — Solved Grid



Across: 2 = 40 · 3 = 15 · 4 = 200 · 5 = 7

Down: 1 = 60 · 2 = 45 · 3 = 150 · 4 = 27

Part 8 · Number Search — Solved Grid

4	**0**	1	6	7	1	6	2	8	5	9	8
2	0	8	2	8	1	6	9	6	9	7	7
9	6	8	0	1	3	4	5	5	6	4	1
4	3	5	5	5	8	**0**	**5**	**3**	9	8	2
0	6	6	0	8	0	3	6	0	6	3	9
1	8	3	**2**	2	1	4	0	6	4	7	**0**
1	5	9	**7**	0	8	7	5	3	5	4	**0**
4	7	7	**0**	**2**	7	3	2	7	8	5	**7**
5	2	3	**6**	3	**0**	9	0	4	5	**2**	**0**
2	3	0	**4**	**5**	8	**0**	0	3	9	1	5

8	8	2	**0**	**5**	**1**	**1**	0	5	**1**	**5**	4
1	3	8	8	7	7	5	**1**	4	7	2	7

Part 8 · Magic Square — Solved (constant 15)

8	**1**	**6**
3	**5**	**7**
4	**9**	**2**

Part 9 · Spot the Mistake

Problem	First wrong step	It should say
Finding the zero of $3z+7$	Step 1	Subtracting 7 from both sides of $3z+7=0$ gives $3z=-7$, **not** $3z=7$. So the correct zero is $z=\frac{-7}{3}$.
Evaluating $7s^2-4s+6$ at $s=-3$	Step 1	¿, not -9 — squaring a negative number always gives a **positive** result. The correct value is $7(9)+12+6=63+12+6=81$.
Identifying the degree of $x^4-3x^3+6x^2-2x+7$	Step 2	The **number of terms** and the **degree** are different things — degree looks only at the highest power of the variable, which here is 4, not the count of terms (5).

Part 10 · Matching

#	Left	Correct match
1	$2x-3$	$x=1.5$
2	$3z+7$	$z=-7/3$
3	$4z-3$	$z=3/4$
4	$5x-15$	$x=3$
5	$6x+18$	$x=-3$

#	Left	Correct match
6	Perimeter of square, side x	$4x$
7	Chess club fee: ₹200 + ₹50/match	$200+50m$
8	°C to °F relation constants	$a=1.8, b=32$

Part 10 · True or False

1-T · 2-F · 3-F · 4-T · 5-T · 6-F · 7-T · 8-F · 9-T · 10-T · 11-F · 12-T

Part 10 · Two Truths and a Lie

Set	The lie	Correction
1	b	Solving $3z+7=0$ gives $3z=-7$, so $z=-7/3$, not $7/3$.
2	c	A constant term like -9 can be written as $-9x^0$, so its degree is 0, not undefined.
3	c	A linear polynomial $ax+b$ with $a\neq 0$ always has exactly one zero — never zero and never two.

Part 11 · The Escape Challenge

EXIT CODE: 4 · 3 · 7 · 15 · 250

(Answer: 4) (Answer: 3) (Answer: 7) (Answer: 15) (Answer: 250)

A linear polynomial is just one straight rule — multiply by a number, add another. Now you can build it from a story, evaluate it, find where it hits zero, and read it off a graph.